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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,657	10/26/2006	Shigeru Nishio	64851 (70904)	2426
21874 7590 04/12/2011 EDWARDS ANGELL PALMER & DODGE LLP P.O. BOX 55874 BOSTON, MA 02205				
EXAMINER				
LEGESSE, HENOK D				
ART UNIT		PAPER NUMBER		
2861				
MAIL DATE		DELIVERY MODE		
04/12/2011		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/567,657

**Applicant(s)**

NISHIO ET AL.

**Examiner**

HENOK LEGESSE

**Art Unit**

2861

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 24 March 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 11 and 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hotomi (US 5,477,249) in view of Hertz (US 4,196,437) and/or Grimes et al. (US 2002/0005876) and Nou (US 2003/0025744) and/or Mantell (US 6,264,298) and/or Yamada (US 2003/0085940).

**Regarding claim 10**, Hotomi teaches an electrostatic suction type fluid discharge device (figs.1,12) which discharges by electrostatic suction a fluid (ink 6,

fig.1), which is electrically charged by voltage application, from a fluid discharge hole of a nozzle (15) of a discharge head (1) onto a substrate (16) opposite to the nozzle (15), wherein:

the electrostatic suction type fluid discharge device (fig.1) comprises line-drawing means (13) for applying a voltage between the nozzle (15) and the substrate (16) while relatively moving the nozzle (15) and the substrate (16) so as to carry out line-drawing (during printing the head 1 and the substrate 16 are relatively moved), the voltage being equal to or greater than a minimum voltage to induce discharge, that is a voltage required to start discharge of the fluid (voltage is applied by the control unit 13 to cause discharge of droplet 1d, fig.3), Hotomi further teaches intermittent discharge (1d) is performed at a frequency depending on the voltage and an electric conductivity of the fluid (col.4 lines 3-13,59-66 and figs.1-3,12),

Hotomi further teaches the fluid discharge hole, provided in the nozzle (nozzle hole 15), having a diameter about 20  $\mu\text{m}$  (col.3 lines 60-61).

Hotomi does not explicitly teach the nozzle (15) has a diameter ranging from 0.01 $\mu\text{m}$  to 15  $\mu\text{m}$ . Furthermore, Hotomi does not explicitly teach controlling a speed of the relative movement so that adjacent ones of discharge pattern are partly overlaid with each other.

However, Hertz teaches fluid discharge device including nozzle having a diameter ranging from 2 to 100  $\mu\text{m}$  (col.6 lines 38-40, col.4 lines 66-67), a nozzle having a diameter of 15  $\mu\text{m}$  (col.6 lines 59-60),

Similarly, Grimes et al teaches fluid discharge device including nozzle having a diameter equal or smaller than 1  $\mu\text{m}$  (paragraph 0038).

Nou teaches fluid discharge device including controlling a speed of the relative movement so that adjacent ones of discharge pattern are partly overlaid with each other (the abstract, paragraphs 0017,0088),

Similarly, Mantell teaches fluid discharge device including controlling a speed of the relative movement so that adjacent ones of discharge pattern are partly overlaid with each other (col.8 lines 13-40, col. 11 lines 32-54),

Yamada also teaches fluid discharge device including controlling a speed of the relative movement so that adjacent ones of discharge pattern are partly overlaid with each other (paragraphs 0065-0067,0074),

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made form the nozzle of Hotomi such that the diameter ranging from 0.01 $\mu\text{m}$  to 15  $\mu\text{m}$  based on the teachings of Hertz and/or Grimes et al and to modify ejection device of Hotomi such that to form overlapping droplets on the medium by controlling the relative speed based on the teachings of Nou and/or Mantell and/or Yamada in order to enable the printhead eject very fine droplets thereby improving the resolution of the printer and form a high quality image more stably and at high speed.

**Regarding claim 12**, Oguchi et al as modified by Nou and/or Mantell and/or Yamada above further teaches wherein, the line-drawing means controls the speed of

the relative movement so that the adjacent ones of discharge pattern are overlaid with each other by 0.5 to 1.5 times of a vertical diameter of each pattern, the vertical diameter being a diameter orthogonal to a direction of the relative movement ( the abstract, paragraphs 0017,0088 of Nou; col.8 lines 13-40, col. 11 lines 32-54 of Mantell teaches overlapping of adjacent drops/patterns by one half or more of their diameter).

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 10 and 12 have been considered but are moot in view of the new ground(s) of rejection. Please see the above rejection under 35 U.S.C. 103(a).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENOK LEGESSE whose telephone number is (571)270-1615. The examiner can normally be reached on Mon.- Fri. Between. 8:00 AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW LUU can be reached on (571)272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/  
Supervisory Patent Examiner, Art  
Unit 2861

H.L.

April 9, 2011